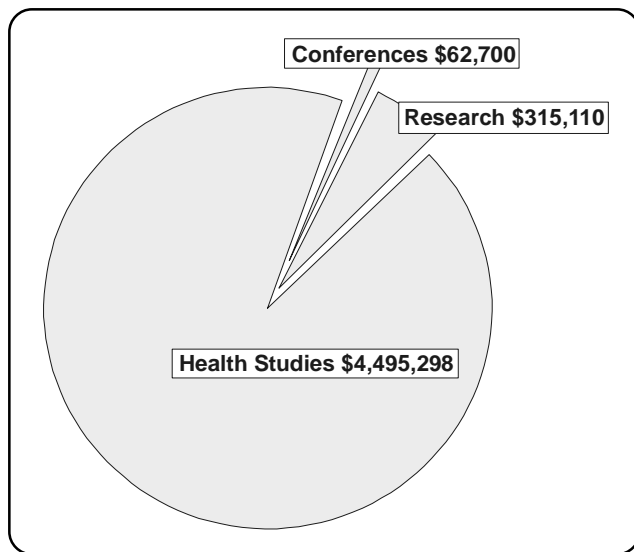


Activities in North Carolina

ATSDR in Partnership with North Carolina

The Agency for Toxic Substances and Disease Registry (ATSDR) is the lead public health agency responsible for implementing the health-related provisions of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). ATSDR is an Atlanta-based federal agency with 400 employees. ATSDR's annual budget for 2002 is \$78 million. ATSDR is responsible for assessing the presence and nature of health hazards at specific Superfund sites, helping to prevent or reduce further exposure and illnesses that result, and expanding the knowledge base about the health effects of exposure to hazardous substances.

ATSDR works closely with state agencies to carry out its mission of preventing exposure to contaminants at hazardous waste sites and preventing adverse health effects. ATSDR provides funding and technical assistance for states to identify and evaluate environmental health threats to communities. These resources enable state and local health departments to further investigate environmental health concerns and educate communities. This is accomplished through cooperative agreements and grants. At this time, ATSDR has cooperative agreements and grants with 31 states, 1 American Indian nation (Gila River Indian Community), and 1 commonwealth (Puerto Rico Department of Health). From 1989 through 2001, ATSDR has awarded more than **\$4,873,108** in direct funds to the state of **North Carolina**. In addition to direct funding, ATSDR staff provide technical and administrative guidance for state-conducted site activities.



ATSDR Site-Specific Activities

Public Health Assessment-Related Activities

One of the agency's important mandates is to conduct **public health assessments** of all National Priorities List (NPL) sites and of other sites where there might be a significant threat to the public health. There have been **29** sites delegated to the NPL in **North Carolina**.

A **public health assessment** is a written, comprehensive evaluation of available data and information on the release of hazardous substances into the environment in a specific geographic area. It assesses the current or future impact of any such releases on public health. ATSDR staff, in conjunction with public health and environmental officials from **North Carolina**, have conducted **32** health assessments in the state.

A **health consultation** is a written or oral response from ATSDR to a specific request for information about health risks related to a specific site, chemical release, or hazardous material. It is a more limited response than a public health assessment. To date, **58** documented health consultations have been performed at **40** sites in **North Carolina**.

An **exposure investigation** uses biomedical testing, personal monitoring, preliminary health evaluations and surveys, and related environmental assessments to determine exposures and monitor compliance with public health recommendations. Following is an example of an exposure investigation conducted in **North Carolina**.

Trinity of America Corporation - Previous environmental and biomedical testing in the Glenola community of **North Carolina** was consistent with human exposure to diisocyanates, a potent group of pulmonary sensitizers. These substances were released from the nearby Trinity of American Corporation facility during polyurethane foam production. Airborne releases from the plant increased when the “quick-cure” method was introduced in 1993. It is believed that this method releases more toluene diisocyanate (TDI) than other processes.

The main goal of this investigation was to identify children with asthma who lived near the plant when the quick-cure method was used. When the parents or guardians of 231 local children were interviewed by telephone, a potential for exposure was confirmed for 204 children; 118 of these children had respiratory symptoms and were offered a clinical evaluation. A diagnosis of asthma was made for 28 of 55 children from the study area who completed a clinical evaluation; asthma was considered possible for another 10 children. Recommendations for medical care were provided as appropriate.

A secondary goal of the investigation was to characterize the current burden of pediatric asthma in the community. Participation in the telephone screening interviews was excellent, but a limited number of eligible children completed a clinical evaluation. As planned, statistical inferences are avoided and grouped analyses are presented as descriptive and exploratory. Even so, the information collected is most consistent with a high prevalence of asthma among the community’s children. Two children had antibodies to diisocyanates, adding to the evidence for exposure.

Public Health Conferences

ATSDR awards grants to state and local agencies to support public health conferences that encourage information sharing, technical discussion, and other training activities related to acute illness and chronic disease related to hazardous substances exposures. ATSDR has conducted or supported the following public health conferences in **North Carolina**:

- Identification of Sentinel Health Events as Indicators of Environmental Contamination, North Carolina Department of Environment, Health & Natural Resources
- Understanding Health Effects of Environmental Hazards, North Carolina Department of Environment, Health & Natural Resources
- Sixth Conference of the International Society for Environmental Epidemiology, University of North Carolina at Chapel Hill
- National Association of County and City Health Officials (NACCHO) Short Course on Environmental Health

Association of Occupational and Environmental Clinics

ATSDR provides financial and technical support to members of the Association of Occupational and Environmental Clinics (AOEC). This support is provided to improve education and communication related to surveillance, diagnosis, treatment, and prevention of illness or injury related to exposure to hazardous substances. The AOEC member institution in **North Carolina** is the **Division of Occupational and Environmental Medicine, Duke University Medical Center**.

Research

In 1997, ATSDR awarded cooperative agreement funds to five universities to conduct research to assess health risk after exposure to mixtures of environmental chemicals. Results of this research will enable ATSDR staff to conduct toxicity assessments of chemical mixtures that affect public health; study the behavior of chemical mixtures; identify various end points that would be affected; evaluate target organs that could be affected; study the mechanisms of action, initiation, progression, and repair of injury; identify biomarkers to determine the health of an organism; and develop qualitative and quantitative methods to assess multiple health effects.

The purpose of the research of **North Carolina State University**, one of the awardees, is to develop an experimental, computational approach to assess the absorption of toxic chemicals through the skin following topical exposures to complex chemical mixtures. This study will investigate the influence of various components of a mixture that can alter their rate and extent of penetration and absorption through the skin.

Health Studies

Health studies are conducted to determine the relationships between exposure to hazardous substances and adverse health effects. They also define health problems that require additional investigation through, for example, a health surveillance or epidemiologic study. ATSDR has conducted or supported the following health studies in **North Carolina**.

Respiratory Effects of Poor Air Quality - The **University of North Carolina** was funded in September 1991 to conduct a study of the effects of poor air quality on respiratory function. This study compared the prevalence of respiratory conditions in three exposed and three control populations. In 1995, ATSDR released its final report related to this study. Analysis showed that important risk factors for lower respiratory infection were day care attendance, pre-term birth, exposure to environmental tobacco smoke, and parents' educational level. No differences in the risk for residence were found between the hazardous waste community and its comparison population. However, for children living in the municipal waste incinerator community, the risk of lower respiratory tract infection was about three times higher than the risk for children in the comparison community. When the investigators examined the rates in the two communities before the incinerator was built, there was no differences in the rates of lower respiratory infection. The results from a 6-month prospective study of lower respiratory infection in these incinerator communities are being analyzed.

Hazardous Substances Emergency Events Surveillance System (HSEES) - The Hazardous Substances Emergency Events Surveillance System (HSEES) was established by ATSDR in 1990 to collect and analyze information about releases of hazardous substances that require remediation according to federal, state, or local law, as well as threatened releases that result in a public health action, such as an evacuation. The goal of HSEES is to reduce the morbidity and mortality experienced by first responders, employees, and the general public resulting from hazardous substances emergencies. A total of 16 state health departments were awarded cooperative agreements (Alabama, Colorado, Iowa, Louisiana, Minnesota, Mississippi, Missouri, New Jersey, New York, **North Carolina**, Oregon, Rhode Island, Texas, Utah, Washington, and Wisconsin) to accomplish these activities. HSEES captures data on more than 5,000 events annually. The HSEES system generates information for states to use for the following activities: (1) conduct presentations to plan prevention strategies to industries (such as agriculture) that account for a significant number of spills, (2) conduct Hazardous Materials (HazMat) training courses, including data on the risk of injury from methamphetamine labs, (3) establish and maintain protection areas for municipal water systems, (4) assist with the proper placement of HazMat teams, (5) develop fact sheets on frequently spilled chemicals or chemicals (such as chlorine and ammonia) that cause a disproportionate number of injuries, (6) develop newsletters to industry and responder and environmental groups, and (7) conduct presentations for state and local emergency planners.

Camp Lejeune, Childhood Leukemia - The purpose of this project is to determine the relationship of exposure to volatile organic compounds (VOCs) and childhood leukemia incidence at this site. Military families stationed at Camp Lejeune that gave birth to children between 1968 and 1985 who can be located will be surveyed. This will include both children who were delivered on or off Camp Lejeune. A brief screening interview will be conducted to identify potential childhood cancer and birth defect cases among children. Self-reported cases of childhood cancer and birth defects will be verified through a review of medical records. The exposure of concern came from contamination in drinking water supplies at Camp Lejeune which occurred for more than 30 years; maximum levels measured in tap water samples were 200 parts per billion (ppb) tetrachloroethylene, 1400 ppb trichloroethylene, and 400 ppb dichloroethylene.

Names of 12,493 personnel known to have given birth while stationed at Camp Lejeune will be cross referenced with military databases to find additional identifiers including, Social Security Number, last known address, and home of record. These identifiers will help locate personnel so they can be asked to participate in the survey. In addition, a referral process will be used to identify parents who had pregnancies that occurred at Camp Lejeune during this time period, but were delivered elsewhere. The current survey project is the first phase of a two-phased

project. Phase I will not include any statistical analyses other than those necessary to determine whether or not to proceed to Phase II. ATSDR will maintain the data gathered in Phase I, except for interagency correspondence with the Navy and follow-up contacts with respondents, until Phase II begins. In Phase II, verified cases and a random sample of non-cases will be frequency matched for inclusion in a nested case-control study assessing the relationship between VOC exposure and the incidence of leukemia/birth defects in this population.

Environmental Exposures Effects and the Immune System - ATSDR collaborated with the University of North Carolina to investigate the effects of residential exposure to an NPL site on the immune system, particularly immunosuppression. Phase I of the study will consist of a cross-sectional prevalence survey of infectious diseases indicating immune function suppression among adults and children who have lived for at least 1 year in either of two communities. In Phase II of the study, a subset of participants in Phase I were asked to undergo a battery of tests designed to assess immune competence. A more in-depth questionnaire was completed in Phase II. In 1994, telephone eligibility interviews were completed and plans for blood testing were developed. In 1995, blood testing was completed. The grant expired in 1997 and the final report was published in November 1998.

Caldwell Systems Inc., North Carolina, Part 1 and Follow-up Study - Caldwell Systems Inc. (CSI) operated a hazardous waste incinerator in Caldwell County that burned chemicals used by the regional furniture and pipeline industries, as well as waste torpedo fuel from the U.S. Navy, from 1977 to 1988. In 1991 and 1992, ATSDR conducted a cross-sectional symptom- and disease-prevalence study of residents living within 1.5 miles of the incinerator. The purpose of the study was to determine whether residents living near the site had a different prevalence of specific diseases or symptoms than did a selected, similar community not located near the site. In the final report published in September 1993, an increased prevalence of self-reported respiratory symptoms (with onset since the beginning of incinerator operation and adjusted for age, gender, and cigarette smoking), but not respiratory or other diseases, was found in the target population compared with the comparison population of Gamewell.

A cross-sectional symptom- and disease-prevalence study was first conducted at the site in 1991-1992. The results demonstrated a significantly higher prevalence of irritant, respiratory, and neurologic symptoms in the target area. The follow-up study was conducted in 1993 to perform an in-depth examination of the respiratory, neurologic, and immune effects reported by target area residents from the first study. Two-hundred-sixty residents who participated in the first study were examined again (52 in the target symptomatic group, 96 in the target asymptomatic group, and 112 in the comparison group). Pulmonary function tests, an adult environmental neurobehavioral test battery, an immune test battery, and a questionnaire were used in the study.

The symptomatic group participants had a statistically significantly higher prevalence of self-reported respiratory symptoms. After classification by smoking status, prevalence of cough and wheeze in nonsmokers from the symptomatic group remained statistically significantly higher than among nonsmokers in the asymptomatic group. Participants from the symptomatic group had a statistically significantly higher prevalence of abnormal pulmonary test function (PFT) results. There were no differences in the ratios of abnormal PFT results in the symptomatic group compared with each of the other groups after adjustment for age and smoking. The final report was published August 1998.

Toxicological Profiles

ATSDR develops toxicological profiles that describe health effects, environmental characteristics, and other information for substances found at NPL sites. These profiles describe pathways of human exposure and the behavior of toxic substances in environmental media such as air, soil, and water. In the previous 5 years, **2,780** of these profiles have been supplied by ATSDR to requesters, including representatives of federal, state, and local health and environmental departments; academic institutions; private industries; and nonprofit organizations in **North Carolina**.

If you would like additional information, contact ATSDR toll-free at (888) 42ATSDR, that is, (888) 422-8737 or visit the homepage at <http://www.atsdr.cdc.gov>
